

2003 AMERICAN OYSTERCATCHER BREEDING ACTIVITY CAPE HATTERAS NATIONAL SEASHORE

Introduction

American Oystercatchers (*Haematopus palliatus*) breed along the U.S. Atlantic coast. It is listed as a species of concern by the Southeastern Shorebird Conservation Plan (Hunter 2000). Breeding activities of this species were monitored at Cape Hatteras National Seashore (CAHA) in 2003. This was the fifth consecutive year of monitoring. By the first week in April, traditional nesting territories were protected with symbolic fencing. Additional sites were posted as these solitary-nesting birds established territories. Monitoring was conducted by a biological technician in each of the three CAHA districts. These include Bodie Island district (south of Nags Head to Ramp 30 on Hatteras Island, excluding Pea Island Wildlife Refuge [PIWR]), Hatteras district (Ramp 30 to Hatteras Inlet) and Ocracoke (Ocracoke Island). The following summary is broken down into geographical areas instead of districts. Note that any reference to Hatteras Island does not include PIWR.

Productivity

This year, 30 pairs of oystercatchers were documented (Table 1). This represents a 27% decline in breeding pairs since monitoring began in 1999 (Chart 1). Of the 43 nests located in 2003, 16 nests (37%) were known to have hatched and 25 nests (58%) were known to be unsuccessful. While these numbers exclude the unknown fate of two nests (5%) located on Green Island, they are the second highest for hatching success since monitoring began in 1999 (Tables 1-5). Of the 28 chicks produced, seven (25%) are known to have reached fledgling age. Overall productivity was 0.23 fledglings per breeding pair. In comparison, previous hatching rates found between 1999 and 2002 ranged from 17% to 44% (Chart 2). Productivity rates during that period fluctuated between 0.12 and 0.62 (Chart 3). It is unknown what productivity rates are required to sustain American Oystercatcher populations in this region. Neighboring PIWR reported five oystercatcher breeding pairs with one successful fledgling in 2003.

Breeding efforts varied between islands within CAHA. In 2003, four of five nesting attempts failed for three known breeding oystercatcher pairs on Bodie Island (Table 1, Chart 2). While the number of successful nests at this site was equal to those in 2002, productivity in 2003 was 0.00 fledglings per breeding pair in comparison to 1.00 in 2002. Productivity was 0.50 fledglings per breeding pair in 2001 on Bodie Island. No successful nesting occurred here in 1999 and 2000 (Tables 4 and 5, Chart 2). This was the first breeding year Green Island at Oregon Inlet was surveyed on foot. Although three pairs were known to produce three nests, only one nest was known to have hatched. The fates of two nests remain unknown. Monitoring efforts were hampered due to lack of boat transportation to the island. At least one chick was produced on Green Island but it is unknown if it successfully fledged. On Hatteras Island, 16 nesting pairs produced 23 nests. Of those, 43% hatched marking 2003 as the highest hatching success rate for Hatteras Island on record. The removal of red fox has undoubtedly benefited nesting efforts (See **Predator Removal** below) Of the 21 chicks produced, six (29%) survived

to fledgling age. Oystercatcher breeding productivity on Hatteras Island was 0.38, the highest since monitoring began (Table 1, Chart 2). Breeding success on Ocracoke Island was lower than the past three years, but equal to that in 1999. This year, eight pairs produced 12 nests. Nest success was 33%; chick survival rate was 8%. Only one chick fledged on Ocracoke Island in 2003. This equates to a productivity rate of 0.13, a decrease from 0.25 in 2002 and a significant decrease over 2001's figure of 1.07 (Table 1, 2 and 3). In 1996, CAHA staff initially monitored breeding activity on Ocracoke Island where productivity among 12 nesting pair was 0.66. Other islands were not included in this 1996 survey.

Factors Influencing Productivity

Of the 25 unsuccessful oystercatcher nests, seven (or 28%) were known to have been lost to predation. They include three clutches lost to fox (*Vulpes vulpes*), one to raccoon (*Procyon lotor*), one to crow (*Corvus spp.*), one to an unknown mammal predator and one uncertain whether it was lost to an unidentified avian or mammalian predator. Eight nests (32%) were lost during weather events with heavy rains, high winds and tides, and one nest (4%) was abandoned after a storm. The largest proportions of failed nests (36%) were due to unknown causes. In these cases, eggs disappeared without definitive evidence of causes.

Of the 28 known chicks, a total of 20 (71%) were lost and the fate of one chick observed on Green Island is unknown (Table 1). Two chicks were lost when run over by off-road vehicle(s). Two chicks were believed lost to fox depredation and another one to two chicks were likely lost to cats. Adverse weather was presumed to have contributed to the loss of up to three chicks. The loss of an additional 12 chicks could not be attributed to any known causes.

American oystercatchers require large undisturbed areas to successfully breed. Many breeding sites were located on beaches with high visitor use, especially on Bodie and Hatteras Islands. Frequent human disturbance can cause the abandonment of nest sites as well as direct loss of eggs and chicks. It is unknown to what degree human activities directly or indirectly impact nesting efforts within CAHA. This year, 27 (67%) of the 43 nests were located in areas normally used by off-road vehicles. Some nests were located in sites already established as seasonal closures. Others were closed to vehicles when territorial behavior or actual nests were discovered. Of these, 13 nests (48%) successfully hatched and three nests (11%) produced fledglings. Six (86%) of the seven oystercatcher fledglings at CAHA were found in areas seasonally closed to off-road vehicle (ORV) traffic. One (4%) nesting attempt was in a day-use area. No nesting or fledgling successes were found in day-use areas. These beach sites are served by adjacent parking lots and have heavy pedestrian use. As in the past two years, no breeding activity was found on beaches adjacent to villages. These beaches have the highest concentrations of pedestrian beach users found at CAHA. Thirteen clutches (48%) were found in "other" sites, not classified as day use or ORV sites. On a day to day basis, these areas were exposed to the least amount of potential human disturbance. Three of these nests (23%) were known to have hatched while the success of two others (15%) was unknown. One brood was known to have produced one (14%) of the total fledglings at CAHA. In 2003, nesting and fledgling success was highest in closures within off-road vehicle areas. This is in contrast to 2002 where the "other" sites category had the highest percentage of nest success and produced fledglings proportionately similar to ORV sites.

Existing closures did not allow adequate protection from human activities in some sites. Two American Oystercatcher chicks were found crushed in tire tracks in June north of Ramp 30. One chick was alive when found and taken to Roanoke Island Animal Clinic where it soon died from injuries sustained during the accident. The three-week-old chicks had moved outside the closure closer to the surf when they were hit. Chick mortality from beach vehicles has been documented in past years. In addition to the two oystercatcher chicks, four least tern chicks between Ramps 23 and 30 and seven Black Skimmer chicks at Ocracoke Inlet were found dead or dying in vehicle tracks during the 2003 breeding season. In all cases the chicks were found adjacent to but outside of posted closures. Neighboring Cape Lookout National Seashore (CALO) also reported the loss of oystercatcher chicks from off-road vehicles in 2003 (J. Altman, personal communication). Vehicles pose the biggest threat to nesting birds after chicks hatch and become mobile. It is unknown if vehicles killed other oystercatcher chicks in 2003. For example, where CAHA staff last observed three chicks at Hatteras Inlet, the birds stood within approximately ten feet of vehicle traffic along two perimeters of their closure. Though the cause of their loss remains unknown, being hit by nearby vehicles can not be ruled out.

Incidents of visitors entering posted bird closures at CAHA were documented between mid-April and September of 2003. These closures did not only represent sites where American Oystercatchers nested but also colonial waterbirds and the threatened Piping Plover (*Charadrius melodus*) as well. Most illegal entries were not witnessed but documented based on vehicle or pedestrian tracks left behind. Numbers are conservative since some individual records involved more than one vehicle or pedestrian. A total of 105 incidents were recorded of ORVs entering posted bird closures in 2003. This number represents a substantial increase to the 52 and 63 incidents recorded in 2001 and 2002 respectively. Of the 105 incidents reported 27 occurred on Bodie Island, 56 on Hatteras Island and 22 on Ocracoke Island. These incidents required, at minimum, repairs to twine strung between posts but often involved the replacement of broken posts and signs. In one incident 43 closure signs were run over at the Cape Point. At Hatteras Inlet bird closure, vehicle tracks came within ten feet of an oystercatcher nest. Illegal pedestrian entry in bird closures numbered 155, compared to 133 and 247 incidents recorded in 2001 and 2002. In 2003, 24 occurred on Bodie Island, 122 on Hatteras Island and 9 on Ocracoke Island. Each pedestrian entry required visitors to lift and stoop under the string that connected all posted signs. Human feces and toilet paper were again frequently observed within the closures. In addition, where closures did not supply ample undisturbed habitat, unintentional human disturbance occurred but was not well documented.

Dogs continue to be a problem in entering protected sites. Leash regulations are not well adhered to by the public. From mid-May through mid-September, data was collected on the number of leashed vs. unleashed dogs observed along the Seashore beaches. Again these are conservative figures since not all beaches were observed at all times. A total of 3425 dogs were documented. Of these, 1971 were unleashed and 1454 were leashed. In an isolated incident at Hatteras Inlet, a dog jumped out of a vehicle and remained allusive for nine days until staff was able to live trap the animal. During this period colonial waterbirds, piping plover as well as American oystercatchers were nesting at the inlet. The dog was seen walking through the bird closure but fled when approached and could not be relocated.

Predator Removal

Red fox populations have been expanding their range southward in CAHA. They were first reported on Bodie Island in 1996 and on Hatteras Island in 2000. Their presence has impacted all ground nesting birds at Oregon Inlet flats, Cape Hatteras Lighthouse beach, Cape Point, South beach and Hatteras Inlet spit. The new Hatteras Island fox population likely used the Bonner Bridge as a corridor to the island. Mel Covey, a Buxton resident, observed a red fox moving south on the bridge in 1999. This route may be continuing. Kris Fair of PIWR observed a dead red fox on the bridge approximately 100 yards from the northern terminus in October 2002. There are no historical records of red fox on Hatteras Island. In 2001, fox depredation was recorded on threatened loggerhead turtle eggs and hatchlings. Fox causing abandonment targeted two plover nests protected by predator exclosures. American Oystercatcher nests were also targeted by this highly efficient predator. Based on the continued and growing danger fox present to threatened species, CAHA decided to trap red fox. Trapping was concentrated on Hatteras Island where the population was lowest. Funds were procured with the help of U.S. Fish and Wildlife Service. Professional trappers from the US Department of Agriculture have removed a total of 43 fox from CAHA in 2002 and 2003. Of these, 30 were from Bodie Island and 13 were from Hatteras Island. Twenty-eight fox were trapped in 2002. This season, total of 15 red fox were taken during the predator management work from June 2 -14, 2003. Of those, 14 red fox were removed from Bodie Island, which included three adult males, two adult females, four juvenile males, and five juvenile females. Another adult male was removed from Hatteras Island near Cape Point. In addition, the trappers took three opossums and one raccoon near the plover nest at Hatteras Inlet. CAHA staff live-trapped a feral cat at Hatteras Inlet spit that was then transported to the Manteo Animal Shelter.

Research

Dr. Ted Simons of North Carolina State University (NCSU) has been monitoring American Oystercatcher breeding success at CALO for six seasons. He has also been reviewing data collected at CAHA over the past five years. He theorizes that relatively low productivity levels may be sufficient to maintain populations of these long-lived birds *if* adult and sub-adult survivorship is high. Survivability levels are unknown at this point. Banding breeding adults and their chicks should help provide answers to this question. Conor McGowen of NCSU successfully color-banded one chick this season but it failed to fledge. Last year he banded five adults and six chicks in 2002. Two of these chicks were resighted at Cape Romain Wildlife Refuge in the fall of 2002 and another near Ft. Myers, FL in January 2003. Four of the five banded adults returned in the spring of 2003 to nest along the same beach areas as they did the previous year. McGowen videotaped two individual nests while being incubated for his ongoing work on nesting disturbance.

Conclusion and Recommendations

American Oystercatcher breeding efforts at CAHA were not highly successful in the past four years. Both hatching and fledgling successes were low. Hatteras Island has consistently had low productivity where as Ocracoke Island has been highly variable. In addition, the number of breeding pairs is showing a decline. Many shorebirds do not normally have high reproductive rates making it difficult to reverse declines and recover rapidly (Brown 2001). It is hoped that

future work conducted by NCSU will help further in identifying problems as well as solutions that ensure the species future in the Seashore. Hurricane Isabel's passing in September of 2003 created a great deal of suitable nesting habitat for beach nesting species. The National Park Service's Southeast Regional Office, US Fish and Wildlife Service and North Carolina Wildlife Resource Commission were invited to visit CAHA and make resource management recommendations in its aftermath. Nesting habitat was identified and recommendations were made to protect species that require such habitat from human disturbance. It is recommended that CAHA provide such protection in a timely manner to best protect all vulnerable beach nesting species.

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Literature Cited

Brown, S., Chickney, B. Harrington, and R. gill, eds. 2001. The US Shorebird Conservation Plan, Manomet Center for Conservation, 60pp.

Hunter, W. C., R. Noffsinger, J. Callazo 2000. Southeastern Coastal Plains – Caribbean Region Shorebird Conservation Plan. US Fish and Wildlife Service, 27 pp.

LIST OF ATTACHMENTS

Appendix A – Nest Detail of American Oystercatchers CAHA

Appendix B –American Oystercatcher Breeding Activity at CAHA 2003

Table 1. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2003

Table 2. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2002

Table 3. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2001

Table 4. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2000

Table 5. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 1999

Chart 1. Number of American Oystercatcher Breeding Pairs at CAHA

Chart 2. American Oystercatcher Nest Success 1999-2003

Chart 3. American Oystercatcher Fledgling Success 1999-2003

Map - American Oystercatcher Nests CAHA 2003

Appendix A Nest Summary of American Oystercatchers 2003

Bodie Island

American Oystercatcher Pair #4/Nest#B1 500m east of Oregon Inlet Bird Closure N 35.78254 W 075.53558

05/10/03	Nest located with 2 eggs, already protected by a temporary closure erected on 4/26 expanded.
05/11/03	Bird observed on nest.
05/12/03	Bird observed on nest.
05/13/03	Bird observed on nest.
05/14/03	Bird observed on nest – 3 eggs. 0/0/0
05/18/03	Bird observed on nest. 0/0/0
05/19/03	Bird observed on nest – 3 eggs, mate standing at boundary, very windy and cold weather. 0/0/0
05/21/03	Bird observed on nest. 0/0/0
05/24/03	Bird observed on nest.
05/25/03	Bird observed on nest.
05/26/03	Bird observed on nest. <i>Too many humans, vehicles and dogs to count.</i>
05/27/03	Bird observed on nest. 0/0/0
05/31/03	NEST LOST. No adults observed. Scrape filled in with sand and rained on. No tracks, eggs or shell fragments observed.
06/04/03	Adults observed later that day re-digging original scrape. Closure removed due to no activity since 5/31/03.

American Oystercatcher Pair #5/Nest #B2 Oregon Inlet Flats; inside SW corner of OIBC north of small dunes N 35.77658 W 075.53683

05/11/03	Initial observation of nest with 1 eggs inside a posted bird closure.
05/12/03	Bird observed on nest
05/13/03	Bird observed on nest. <i>2 humans & 1 vehicle at 0.3miles.</i>
05/14/03	Bird observed on nest – 2 eggs. Vehicle tracks breached closure 200ft from nest. Fox tracks leading directly up to and away from nest. <i>1 vehicle at 0.5 miles.</i>
05/18/03	Bird observed on nest. Foul weather. 0/0/0
05/19/03	Bird observed on nest. Mate standing next to nest. Foul weather. 0/0/0
05/21/03	Bird observed on nest – 3 eggs. Fox tracks all over dunes and flats as close as 20ft from nest. <i>2 humans & 1 vehicle at 0.5miles.</i>
05/24/03	Bird observed on nest.
05/25/03	Bird observed on nest. Fox tracks entering closure 100ft from nest.
05/26/03	Bird observed on nest. Vehicle tracks breached closure coming as close at 100ft from nest. <i>Too many humans, vehicles and dogs to count.</i>
05/27/03	NEST LOST. No adults observed. Rain last night. Scrape still fresh with no eggs or shell fragments. Fox tracks all around nest and as close as 3ft from scrape. A plastic kite found on the ground 10 ft from the nest.

American Oystercatcher Pair #7/Nest #B3
Inside SE corner of Oregon Inlet Bird Closure
N 35.7777 W 075.53561

05/21/03	Initial observation of nest with 1 egg located inside protected bird closure.
05/24/03	Bird observed on nest – 3 eggs.
05/25/03	Bird observed on nest. Fox tracks observed within 50ft of nest and throughout bird closure.
05/26/03	Bird observed on nest. Vehicle tracks breached closure boundary and through closure as close as 100ft from nest. <i>Too many humans, vehicles, and dogs to count.</i>
5/27/03	Bird observed on nest. Raining. 0/0/0
05/31/03	Bird observed on nest. 0/0/0
06/01/03	Bird observed on nest – 3 eggs. Very windy. Entire flats flooded last night. Nest was filmed today by Conor McGowan. 0/0/0
06/02/03	Bird observed on nest. 0/0/0
06/03/03	Bird observed on nest. 0/0/0
06/04/03	Bird observed on nest. Rain. 0/0/0
06/07/03	NEST LOST. No adults observed. Sand filling in empty scrape. No tracks, eggs, or shell fragments visible.

American Oystercatcher Pair #4/Nest #B4
Oregon Inlet Flats SE
N 35.78101 W 075.53316
*** re-nest**

06/09/03	Initial observation of nest with 1 egg in an ORV area. Nest protected by posted boundary.
06/10/03	Bird observed on nest. 0/0/0
06/11/03	Bird observed on nest. 0/0/0
06/14/03	Bird observed on nest – 2 eggs. 0/0/0
06/15/03	Bird observed on nest. <i>2 vehicles at 0.1 mile.</i>
06/16/03	Bird observed on nest. <i>2 vehicles at 0.1 mile</i>
06/17/03	Bird observed on nest. 0/0/0
06/18/03	Bird observed on nest. 0/0/0
06/19/03	Bird observed on nest. <i>37 vehicles at 0.1 mile</i>
06/21/03	Bird observed on nest.
06/22/03	Bird observed on nest.
06/23/03	Bird observed on nest. 0/0/0
06/24/03	Bird observed on nest – 2 eggs. 1 pair of least terns observed in closure. 0/0/0
06/25/03	Bird observed on nest. 0/0/0
06/28/03	Bird observed on nest. 2-3 pairs of least terns observed in closure. 0/0/0
06/29/03	Bird observed on nest. 0/0/0
06/30/03	Bird observed on nest.
07/01/03	Bird observed on nest – 2 eggs. 2-3 pairs of least terns observed in closure. <i>2 vehicles at 0.1 mile; 2 vehicles at 0.2 mile</i>
07/02/03	Bird observed on nest. 0/0/0
07/05/03	Bird observed on nest – 2 eggs. 3+ least tern pairs observed in closure. <i>1 vehicle at 0.1 mile</i>
07/06/03	Bird observed on nest crouching as if hatching eggs underneath.
07/07/03	Bird observed on nest with 2 chicks. 1 chick was dry, the other was weaker and couldn't stand well. Adult observed feeding molecrabs to chicks. Closure expanded at 5:15pm to connect to Oregon Inlet Bird Closure and make a corridor to suspected feeding grounds at salt pond.
07/08/03	2 adults and 2 chicks observed in northwest side of closure – chicks more active.
07/09/03	2 adults and 2 chicks observed 10ft from saltpond southern shoreline inside Oregon Inlet Bird Closure.
07/12/03	2 adults and 2 chicks observed inside Oregon Inlet Bird Closure on the northeast side of the long dune.
07/13/03	2 adults and 2 chicks observed inside east side of OIBC near the long dune.

07/14/03	2 adults and 2 chicks observed just southwest of original nesting closure in an ORV area – lots of rain; flats flooded inside OIBC and beyond protective boundaries.
07/15/03	2 adults and 2 chicks observed entering east boundary of OIBC at 6:30am.
07/16/03	2 adults and 2 chicks observed inside OIBC on dry flats near south shoreline of saltpond.
07/19/03	2 adults and 2 chicks observed inside east boundary of original OIBC.
07/21/03	2 adults and 2 chicks observed inside east boundary of OIBC near small dune.
07/22/03	1 adult and 2 chicks observed at northeast corner of OIBC boundary south of saltpond. Very windy, sand blowing.
07/23/03	1 adult and 2 chicks observed at northeast corner of OIBC boundary south of saltpond.
07/26/03	CHICKS LOST. 2 adults observed foraging; no chicks observed; no protective behavior at approach.

American Oystercatcher Pair #5/Nest #B5
Inside SW corner of old Oregon Inlet Bird Closure
N 35.77735 W 075.53831
*** re-nest**

06/09/03	Initial observation of nest with one egg inside protected bird closure.
06/10/03	Bird observed on nest. 0/0/0
06/11/03	Bird observed on nest.
06/14/03	Bird observed on nest.
06/15/03	Bird observed on nest – 2 eggs. 0/0/0
06/17/03	Bird observed on nest. 0/0/0
06/21/03	Bird observed on nest.
06/22/03	Bird observed on nest.
06/23/03	Bird observed on nest. 0/0/0
06/24/03	Bird observed on nest. 0/0/0
06/25/03	NEST LOST. No adults in area, nest abandoned, no eggs, shells or shell fragments found. Fresh fox tracks (possibly 2 sets) leading up to 1-1/2 ft from nest and away from empty scrape adjacent to AMOY tracks.

Green Island

American Oystercatcher Pair #8/Nest #G1 Green Island on top of dune in center of island in grass N 35.76232 W 075.53024

05/24/03	Initial observation of nest with 3 eggs inside posted boundary.
06/11/03	Bird observed on nest – 2 eggs.
06/22/03	1 adult observed on beach near nest chasing gulls.
06/24/03	1 adult observed on beach near nest.

American Oystercatcher Pair #9/Nest #G2 Northeast side of Green Island 40ft from shoreline N 35.76456 W 075.53052

05/25/03	Initial observation of nest with 2 eggs. Nest protected by posted boundary.
06/02/03	Bird observed on nest.
06/03/03	Bird observed on nest.
06/11/03	Bird observed on nest – 2eggs.
06/21/03	1 adult observed in area of nest.
06/22/03	<i>1 boat observed on shoreline 50ft from nest</i>
06/24/03	1 adult observed brooding on or near nest. <i>4+ humans and 2 boats at 50ft.</i>
06/29/03	1 adult observed brooding with wings spread near nest site.

American Oystercatcher Pair #10/Nest #G3 West side of Green Island in sea rocket on top of 2nd dune from the west N 35.78101 W 075.53316

05/25/03	Initial observation of nest with 1 egg inside posted boundary.
06/11/03	Bird observed on nest – 2 eggs.
06/22/03	1 adult observed near nest site.

Hatteras Island

American Oystercatcher Pair #11/Nest #BH1 "The Waddles" 1.0 miles South of Ramp 27 N 35.45452 W 075.48337

04/16/03	Initial observation of scrape at 35.45482° 075.48320°. Territory protected by posted boundary.
04/23/03	Initial observation of nest with 3 eggs within the original territory. Ocean front boundary re-posted - was washed out and had not been checked due to high tides. Nest site different than previously recorded scrape. Adults chasing flocks of fish crows, but no protective behavior at my approach to nest.
04/26/03	Bird observed on nest. <i>3 humans 500ft from nest, 1 vehicle, 0 predators.</i>
04/27/03	Bird observed on nest – 3 eggs. <i>0 humans, 0 vehicles, 0 predators.</i>
04/28/03	Bird observed on nest. <i>0 humans, 0 vehicles, 0 predators</i>
04/29/03	Bird observed on nest.
04/30/03	Bird observed on nest – 3 eggs. <i>0 humans, 0 vehicles, 0 predators</i>
05/03/03	Bird observed on nest – 3 eggs. Very windy, sand blowing. <i>0 humans, 0 vehicles, 0 predators</i>
05/04/03	Bird observed on nest. Very windy, sand blowing. <i>0 humans, 0 vehicles, 0 predators</i>
05/05/03	Bird observed on nest – 3 eggs. <i>0 humans, 0 vehicles, 0 predators</i>
05/06/03	Bird observed on nest. <i>0/0/0</i>
05/07/03	One adult observed alert at surfline. <i>0/0/0</i>
05/10/03	Bird observed on nest. <i>2 humans, 1 vehicle, 1 dog @ 500ft</i>
05/11/03	Bird observed on nest. Least terns engaged in courtship behavior 200ft from nest inside posted closure. <i>1 vehicle @ 500ft, 5 vehicles @ 0.5 miles</i>
05/13/03	Bird observed on nest – 3 eggs. <i>3 humans, 2 vehicles, 2 dogs @ 0.1 mile</i>
05/14/03	Bird observed on nest.
05/17/03	Bird observed on nest. Very windy and cold weather. <i>0/0/0</i>
05/19/03	Hatched. One adult and 3 new chicks observed 10ft from nest.
05/21/03	One adult and at least 2 chicks observed 20ft from nest. <i>0/0/0</i>
05/24/03	One adult and 1 chick observed.
05/26/03	2 adults and 1 chick observed inside the south end of the closure behind the dunes. Both adults alarm calling at my approach. <i>0/0/0</i>
05/27/03	One adult engaged in protective behavior inside closure. <i>0 humans, 1 vehicle @ 0.1 mile, 0 dogs.</i>
05/31/03	One adult and 1 chick inside closure near nest site. AMOY tracks observed outside of southern end of closure. <i>0/0/0</i>
06/01/03	2 adults observed in protective behavior inside closure behind nest site as if chicks were hidden in grass or dunes nearby. Chick was banded by Conor McGowan later in the day and was observed again at dusk.
06/02/03	2 adults observed in protective behavior inside closure near nest site. <i>0/0/0</i>
06/03/03	One adult and one chick observed in dunes behind the closure. Adult acting protective and alarm calling. <i>0/0/0</i>
06/04/03	One adult observed engaged in protective behavior inside closure. <i>0/0/0</i>
06/07/03	One adult observed in closure proceeded to dive-bomb me after finding me hiding in dunes for observations. <i>2 humans, 1 vehicle, 0 dogs @ 0.2 miles</i>
06/08/03	One adult observed preening in dunes behind closure, protective behavior ensued upon my approach. <i>1 vehicle at 500ft</i>
06/10/03	No sign of adults at first approach. Upon walk-through of closure, 3 adult birds flew into the closure and started false nesting. <i>5 humans, 1 vehicle, 0 dogs @ 0.1 mile</i>
06/11/03	2 adults observed roosting in tire ruts in front of closure, ran into closure while alarm calling at my vehicular approach.
06/14/03	2 adults observed brooding separately inside closure. Upon my approach adults ran away while alarm calling and began false nesting.
06/15/03	2 adults observed in front of closure, ran into closure while alarm calling at my vehicular approach.
06/16/03	2 adults observed in closure. 1 jaeger observed on beach at surf in front of closure. Both adults ran from jaeger to closure and back while calling at the jaeger.

06/17/03 1 adult in closure chasing at gull, 1 adult outside southern boundary of closure – ran to dunes upon my vehicular approach.

06/18/03 2 adults observed at surf 0.1 mile south of closure, began alarm calling and false nesting at my vehicular approach.

06/21/03 2 adults observed at surf south of closure

06/22/03 2 adults observed at surf 0.3 miles south of nest. Both adults ran towards dunes at my approach.

06/23/03 2 adults observed at surf just south of closure – moved towards dunes upon my approach. Fox tracks observed in dunes 0.1 mile north of nest.

06/24/03 2 adults observed at surf in front of closure – moved towards closure upon my approach. 7 humans, 2 vehicles, 0 dogs @ 0.2 miles

06/25/03 2 adults observed at surf in front of closure.

06/28/03 6 adults observed inside closure. One adult ran from surf into closure alarm calling upon my approach.

06/30/03 2 adults observed at surf in front of closure – ran into closure at vehicular approach.

07/05/03 2 adults observed at surf in front of closure.

07/07/03 2 adults observed at surf just south of closure.

07/08/03 2 adults observed at surf just south of closure.

07/09/03 1 adult observed at surf, 1 adult observed at dune 0.2 miles south of closure.

07/21/03 Pair observed mating inside closure.

07/22/03 Pair observed roosting inside closure.

7/23-8/10/03 Pair observed in or near closure – no activity.

American Oystercatcher Pair #12/Nest #BH2
0.8 miles south of Ramp 27
N 35.45737 W 075.48289

04/26/03 Initial observation of nest with 2 eggs located in an ORV area. Nest protected by a posted boundary. 3 humans and 1 vehicle 500ft from nest, 0 predators.

04/27/03 Bird observed on nest – 2 eggs. 0 humans, 0 vehicles, 0 predators.

04/28/03 Bird observed on nest. 0 humans, 0 vehicles, 0 predators.

04/29/03 Bird observed on nest. 0 humans, 0 vehicles, 0 predators.

04/30/03 Bird observed on nest – 3 eggs. 0 humans, 0 vehicles, 0 predators.

05/03/03 Bird observed on nest. Very windy, sand blowing. 0 humans, 0 vehicles, 0 predators.

05/04/03 Bird observed on nest. Very windy, sand blowing. Tide breached closure making beach impassible at high tide. 0 humans, 0 vehicles, 0 predators

05/05/03 Bird observed on nest. Tide breached closure making beach impassible at high tide. 0 humans, 0 vehicles, 0 predators

05/06/03 Bird observed on nest. Tide breached closure at high tide. 0/0/0

05/07/03 Bird observed on nest – 3 eggs. 0/0/0 cutting grass beside highway 0.1mile behind nest

05/11/03 Bird observed on nest. 1 vehicle at 100m, 6 vehicles at 0.2miles

05/13/03 Bird observed on nest – 3 eggs. 3 humans, 2 vehicles and 2 dogs at 0.1 mile.

05/14/03 Bird observed on nest. 3 humans, 2 vehicles and 1 dog at 0.3 miles.

05/17/03 Bird observed on nest. 0/0/0

05/19/03 Bird observed on nest.

05/21/03 Bird observed on nest – 3 eggs. Vehicle breached closure – tracks came within 20ft of nest, sign down – re-posted. 0/0/0

05/24/03 Bird observed on nest.

05/26/03 Hatched. Pair observed with 3 chicks inside closure 20ft in front of nest. 1 adult shading chicks from rain, other adult chasing ruddy turnstone. Least terns observed inside northern part of closure.

05/27/03 2 adults and 3 chicks observed inside closure.

05/31/03 2 adults and 2 chicks observed inside northern end of closure.

06/01/03 2 adults and 2 chicks observed inside closure. Adults acting protective. 0/0/0

06/02/03 2 adults observed in protective behavior inside closure. 2 humans at 900ft

06/03/03 2 adults and 2 chicks observed. 1 adult flew in and fed mole crabs to the chicks. 1 human @0.2 miles

06/04/03 2 adults and at least 2 chicks observed in closure. Raining. 0/0/0
06/07/03 2 adults observed hiding in dune acting protective. 1 vehicle @ 0.2 miles
06/08/03 2 adults and 1 chick observed. 1 human @ 0.2 miles
06/09/03 2 adults and 1 chick observed at dunes inside southern end of closure. 0/0/0
06/10/03 2 adults observed in protective behavior inside closure. 0/0/0
06/11/03 2 adults and one chick observed inside closure. 4 humans, 1 vehicle, 2 dogs @ 0.1 mile
06/14/03 2 adults observed in protective behavior inside closure.
06/15/03 2 adults and 1 chick observed. 0/0/0
06/16/03 2 adults observed chasing jaeger at surf. 0/0/0
06/17/03 2 adults and 1 chick observed hiding in sea rocket inside closure. Very windy, sand blowing.
0/0/0
06/18/03 2 adults and 1 chick (in adult plumage) observed in closure. 1 human, 1 vehicle, 0 dogs @ 0.3 miles
06/21/03 2 adults observed in protective behavior inside closure.
06/22/03 2 adults and 1 chick observed inside north end of closure.
06/23/03 2 adults observed in protective behavior inside closure.
06/24/03 2 adults and 1 chick observed inside north end of closure. 7 humans, 2 vehicles @ 0.3 miles; 2 humans, 1 vehicle @ 0.1 mile
06/25/03 2 adults and 1 chick observed outside closure in ORV area to south of closure boundary. 2 humans, 1 vehicle @ 0.1 mile
06/28/03 2 adults observed at surf in front of north end of closure.
06/29/03 1 chick fledged. 2 adults and fledgling observed inside closure.
06/30/03 2 adults and 1 fledgling observed inside closure.
07/01/03 2 adults and 1 fledgling observed inside closure.
07/02/03 2 adults and 1 fledgling observed inside closure.
07/05/03 2 adults and 1 fledgling observed inside closure.
07/06/03 2 adults and 1 fledgling at surf in front of closure. Fledgling observed in flight.
07/07/03 2 adults and 1 fledgling observed inside closure.
07/08/03 1 adult and 1 fledgling observed at surf in front of closure.
07/09/03 2 adults and 1 fledgling observed inside closure.
07/14/03 2 adults and 1 fledgling observed inside closure.
07/15/03 No birds observed in area.
07/22/03 2 adults and 1 fledgling observed 0.2 miles north of closure.
07/23/03 2 adults and 1 fledgling observed 0.3 miles north of closure.

American Oystercatcher Pair #13/Nest #BH3
1.2 miles south of Ramp 23
N 35.51374 W 075.47320

04/29/03 Initial observation of nest with 1 egg in gully between 1° and 2° dune line in an ORV area. Nest site protected by posted boundary. 0 humans, 0 vehicles, 0 predators
04/30/03 Bird observed on nest – 1 egg. 0 humans, 0 vehicles, 0 predators
05/03/03 Bird observed on nest. Very windy, sand blowing. 0 humans, 0 vehicles, 0 predators
05/04/03 Bird observed on nest. Very windy, sand blowing. 0 humans, 0 vehicles, 0 predators
05/05/03 Bird observed on nest – 1 very large oblong egg. Terns colonizing 500ft from closure. 1 vehicle drove past closure, 0 humans, 0 predators
05/06/03 Bird observed on nest.
05/07/03 Nest not checked, mate observed standing at boundary of closure. 2 humans at 0.2miles, 1 vehicle at 0.2miles, 4 vehicles at 0.5miles, 0 predators.
05/10/03 Bird observed on nest. Terns colonizing south of closure. 3 humans and 1 vehicle at 500m, 4 humans, 3 vehicles and 6 dogs at 1000m, 2 vehicles at 2000m.
05/11/03 Bird observed on nest. 2 humans and 1 vehicle at 0.1mile, 2 humans and 1 vehicle at 0.2miles.
05/13/03 Bird observed on nest – 1 egg. 0 humans, 0 vehicles, 0 predators.
05/14/03 Bird observed on nest. Mate standing at boundary. 2 humans and 1 vehicle at 500m in front of closure.
05/17/03 Bird observed on nest. Bad weather – windy, cold. 0/0/0

05/18/03 Bird observed on nest. Bad weather – windy, cold, rain. 0/0/0

05/21/03 Bird observed on nest – 1 egg. Tern colony 100m south of nest. 2 humans, 1 vehicle 0.1 mile; 4 humans @ 0.3 miles

05/26/03 1 adult observed in dunes south of closure, adult in aerial display with another AMOY pair. No protective behavior at my approach to nest – nest filled with sand, no egg or chick observed. Pair acted protective as I approached in their direction.

05/27/03 1 adult observed in south end of tern closure 0.1 miles south of nest chasing and attacking gulls and being divebombed by least terns. 1 adult and 1 chick in dunes behind tern colony.

05/31/03 2 adults inside tern closure 0.2 miles south of nest being dive-bombed by least terns. Aerial displays and chasing my vehicle and me. 2 vehicles @ 0.2 miles

06/01/03 2 adults keeping very close to 1 chick, acting very protective. 2 vehicles @ 0.3 miles

06/02/03 1 adult and 1 chick on top of dune behind tern closure 0.2 miles south of nest. 0/0/0

06/03/03 1 adult false nesting in front of tern closure 0.2 miles south of nest. 0/0/0

06/04/03 2 adults observed in tern closure 0.3 miles south of nest - 1 guarding in front of dunes, 1 in dunes alarm calling/protective behavior. 0/0/0

06/07/03 1 adult and 1 chick at dune line in ORV area just south of tern closure 0.4 miles south of nest, 1 adult at surf 0.5 miles south of nest. 0/0/0

06/08/03 1 adult and 1 chick observed at dune line just inside southern boundary of tern closure 0.4 miles south of nest. 1 vehicle, 1 dog @ 0.2 miles

06/10/03 1 adult and 1 chick observed at dune line in ORV area just south of tern closure 0.4 miles south of nest. 2 adult AMOYs observed at surf in front of closure (may not be individuals from this pair?)

06/11/03 1 adult and 1 chick observed at dune line, 1 adult at surf. 3 humans, 1 vehicle @ 100ft; 2 humans, 1 vehicle @ 0.1 mile

06/14/03 2 adults and 1 chick observed at dune line 0.8 miles south of nest.

06/15/03 2 adults and 1 chick observed at dune line 0.8 miles south of nest.

06/16/03 2 adults at surf acting protective 0.9 miles south of nest. 0/0/0

06/17/03 Pair not observed in area.

06/18/03 2 adults observed at surf 0.5 miles south of nest. 0/0/0

06/21/03 2 adults observed acting protective.

06/23/03 2 adults at surf in front of closure

07/22/03 2 adults and one fledgling seen at surf 0.5 mi. south of Ramp 23; improbable this is same family unit having not been seen in a month.

American Oystercatcher Pair #14/Nest #BH4
0.7 miles north of Ramp 30
N 35.44863 W 075.48378

05/10/03 4 scrapes located on berm. Territory protected by posted boundary. Least terns observed in courtship and scrapes found.

05/13/03 Initial observation of nest with 1 egg inside posted boundary. 2 humans, 2 vehicles, and 2 dogs at 0.5 miles.

05/14/03 Bird observed on nest. 2 humans, 1, vehicle at 0.1 mile.

05/17/03 Bird observed on nest. 0/0/0

05/19/03 Bird observed on nest, mate observed at ocean boundary of closure.

05/21/03 Bird observed on nest – 3 eggs. Least terns observed in south end of closure. 0/0/0

05/24/03 Bird observed on nest.

05/26/03 Bird observed on nest.

05/27/03 Bird observed on nest – 3 eggs. 0/0/0

05/31/03 Bird observed on nest, mate at shoreline. 0/0/0

06/01/03 Bird observed on nest – 3 eggs. Nest videotaped by Conor McGowan. 2 humans and 1 vehicle at 0.1 mile.

06/02/03 Bird observed on nest, mate 20ft from nest. 3 least terns observed in south end of closure. 0/0/0

06/03/03 Bird observed on nest. 0/0/0

06/04/03 Bird observed on nest. 20 least terns observed in south end of closure. 0/0/0

06/07/03 Bird observed on nest, mate at shoreline. 18 least terns observed in closure. *2 humans and 1 vehicle at 500ft; 1 human and 1 vehicle at 0.1 mile.*

06/08/03 Bird observed on nest – 3 eggs. Least tern colony established in closure (2 birds observed on nest). *0/0/0*

06/09/03 Bird observed on nest. 1 chick. *0/0/0*

06/10/03 Bird observed on nest. 2 chicks and 1 egg. *0/0/0*

06/11/03 1 adult and 3 chicks observed near nest. *3 humans and 1 vehicle at 0.1 mile; 5 humans and 1 vehicle at 0.5mile*

06/14/03 2 adults and 3 chicks observed in closure.

06/15/03 2 adults and at least 2 chicks observed in closure.

06/16/03 2 adults and at least 2 chicks observed in closure. *0/0/0*

06/17/03 2 adults and at least 2 chicks observed in closure. Very windy. *0/0/0*

06/18/03 2 adults and 3 chicks observed in closure.

06/21/03 2 adults and 1 chick observed in closure.

06/22/03 2 adults observed feeding 2 chicks ion closure.

06/23/03 2 adults and 1 chick observed in closure. *5 humans and 1 vehicle at 500ft; 10 humans and 2 vehicles at 0.1 mile*

06/24/032 adults observed in closure acting protective. *7 humans and 2 vehicles at 500ft.*

06/25/031 adult and 1 chick observed in closure.

06/28/03 2 adults observed 10ft from 1 chick. Chick observed 15ft oceanside of closure boundary in ORV area/tire ruts. Chick stood still at my vehicular approach and moved slowly towards closure after I stopped my truck a few feet from the chick. Least terns observed diving towards the chick as it re-entered the closure. Request placed to expand boundary 30ft oceanward to protect chick. *2 humans and 1 vehicle at 700ft; 2 humans and 1 vehicle at 500ft; 1 vehicle at 0.1 mile; 4 humans at 0.3miles.*

06/29/03 2 adults observed in closure acting very disturbed. 1 chick found hit by car in tire ruts – injured – transported to animal clinic where it later died of chest contusions. 1 chick found dead, buried in tire ruts. Request for closure expansion rescinded. *3 vehicles at 0.1 mile.*

06/30-8/10/03 Pair observed in or near closure – no activity.

Pair #1/Nest #H1
North of Buxton, 3.2 mi. S of R38
N 35°27897 W 75°51691

Band combination: Left – R/G flag; Right – B R/R

4/17/03 Nest discovered with 3 eggs present.

4/19/03 Storm front moving through. High, high tides & strong winds. Unable to check nest.

4/20/03 Storm still strong. Unable to check nest.

4/21/03 Active. Incubating 3 eggs.

4/25/03 Active. Adult on nest. Heavy rains previous night.

5/01/03 Active. Adult incubating nest.

5/08/03 Active. Adult incubating 3 eggs.

5/15/03 Active & hatching. 1 chick observed, 2 eggs still in nest.

5/19/03 Active. At least 2 chicks observed. Weather very cold & windy. Left site as to not disturb parents trying to protect chicks from storm.

5/22/03 Active. 1 chick found. Inclement weather. Cat tracks found in area.

5/25/03 Active. Only 1 chick found.

5/31/03 Active. 1 chick.

6/06/03 Active. 1 chick.

6/20/03 Status unknown. Have not been able to check area due to weather & eroding beach conditions. Saw 3 large birds in area together but no fledgling. Chick would've been 37 days old at this point.

6/29/03 Inactive. Adults in area but no fledgling to be found. Cat tracks throughout closure. Adults have new scrape, but no eggs lain at this time. Chick was 23 days old at last observation on 6/06/03.
 * Cause of chick loss unknown. May have been due to adverse weather or cat predation.

Pair #2/Nest #H2
N of Buxton, 3 mi. S of R38
N 35°28429 W 75°51578
 Band combination: Left – G/G flag; Right – R Y/W

5/01/03	Nest with 3 eggs found in between dunes (where old Highway 12 was before washed out by hurricane).
5/08/03	Active with 3 eggs present.
5/15/03	Active with 3 eggs present.
5/22/03	Active & hatching; 1 chick present so far.
5/25/03	Unable to locate chicks but adults very protective: definitely chicks in the area but hidden well. Cat tracks found on dunes fronting ocean.
5/31/03	Active with 2 chicks present.
6/06/03	Active. Unable to locate chicks. Parents protective and escorting vehicle out of area.
6/20/03	Status unknown. Adults located but did not find any chicks. Have not seen chicks for a long time (should be 27 days old). However adults are extremely protective and obviously disturbed by my presence. Walked area in between dunes where original nest was and found a single egg laying in middle of area on flat sand, no nest cavity (possible egg from original nest that was not viable and/or egg rolled out of nest)
6/29/03	Inactive. No chicks found. Unable to relocate nest for egg mentioned above. Adults still acting protective, false nesting but have not found new nest scrape.
7/06/03	Adults found at tide line with fledgling. Chick is 46 days old and flying .
7/26/03	Adults and fledgling still in same area.

Pair #3/Nest #H3
S. Beach, 0.4 mi SW of Cape Point campground drain
N 35°23383 W 75°55803
 “Mr. & Mrs. Greenlegs”
 Band combination: Left – W/G flag; Right – G/G

5/03/03	Active with 1 egg present. Very windy.
5/04/03	Active. Birds extremely flighty. Easily disturbed by vehicle presence.
5/05/03	Active with 2 eggs present.
5/09/03	Inactive. Birds away from nest. Scrape disturbed and somewhat caved in. Mammal tracks directly over nest and heavily around area. Tracks at nest were blown out but followed for 0.1 mile south of nest to clearly confirm them as fox tracks. Tracks became heavy even further south of nest. No shells or shell fragments found. * Cause of failure due to fox predation.

Pair #4/Nest #H4
Cp. Pt. Bird closure, near “Salt Pond Rd”
N 35°22842 W 75°53854

5/04/03	Active with 2 eggs present. Nest found on small dune hidden in vegetation.
5/05/03	Active. Adults incubating.
5/08/03	Inactive. Birds away from area. Eggs gone. No shells or shell fragments found in area. No predator tracks found. Nest scrape appeared undisturbed. * Cause of failure unknown.

Pair #5/Nest #H5
Hatteras Inlet; Inlet proper
N 35°18943 W 75°74933

5/05/03 Active with 3 eggs present.
 5/11/03 Active. Adult incubating 3 eggs.
 5/15/03 Status unknown. Bird not on nest.
 5/17/03 Active. Adult incubating 3 eggs.
 5/24/03 Active. Adult incubating 3 eggs.
 5/28/03 Active. Adult incubating 3 eggs.
 6/01/03 Active (near hatching). Conner checking on nest as possible site to film for disturbance study. He located nest with only 1 egg present. No shell fragments were found from other eggs and no chicks were observed. Adults very aloof, not acting protective of anything - not even of last egg in nest scrape. Exhibiting a more traumatized behavior than protective. Weather conditions have been very bad...heavy rains & strong winds.
 6/05/03 Inactive. Last egg gone. No new AMOY tracks around nest area (nest may have been lost a couple of days ago. No predator tracks or other signs of loss. Adults very disinterested in my presence.

Nest could have started hatching and chicks lost to adverse weather conditions. Adults seem to have lost interest in egg still in nest after storm has passed.

* Cause of nest failure due to adverse weather conditions.

Pair #6/Nest #H6
S. Beach, just SW of Cape Point campground drain
N 35°23310 W 75°55201

5/16/03 Active with 2 eggs present. Adults nested on very top of largest dune amongst the vegetation.
 5/18/03 Active. Adult incubating nest.
 5/22/03 Inactive. Large dog tracks found through closure and fox tracks found throughout the dunes. Nest was laid amongst the vegetation so not able to follow fox tracks directly up to nest scrape but they were present within 1 foot of the nest. All eggs gone. No shell fragment found.
 * Cause of nest failure due to fox predation.

Pair #7/Nest #H7
Hatteras, 0.8 mi S of R55
N 35°20040 W 75°71743
 "prickly pear" pair

5/17/03 Active with 3 eggs present.
 5/18/03 Active. Adult incubating nest.
 5/23/03 Active. Adult incubating nest. Heavy rains.
 5/24/03 Active. Incubating.
 5/28/03 Active. Incubating.
 5/31/03 Active. Adult incubating nest.
 6/01/03 Active. 3 eggs still present.
 6/05/03 Active. Adults incubating.
 6/09/03 Active. Adults incubating (due to hatch.).
 6/12/03 Status unknown. Not on nest. Nest scrape relocated with no eggs present. No shell fragments in area or other signs of loss. Could nest have hatched and adults moved chicks? Nest lost? Fox tracks were found on ocean face of dune fronting closure.
 6/13/03 Status unknown. One adult found feeding at tide line. Other adult nowhere in sight. No evidence of chicks present.
 6/14/03 Inactive. Both birds found resting at front of closure in sandy area. No evidence of chicks in the area. Adults non-responsive and not acting protective.
 *Cause of nest failure is unknown. Fox tracks were present on dune face in front of closure but unable to locate tracks near actual nest cavity.

Pair #3/Nest #H8
South Beach, 0.5 mi. S of the ramp behind the drain
N 35°23415 W 75°56027
 “Mr. & Mrs. Greenlegs”
 Band combination: Left – W/G flag; Right – G/G
 *second nest attempt

5/22/03 Active. Adults incubating 3 eggs. Very flighty. Easily disturbed by passing vehicles.
 5/24/03 Active. Adult incubating.
 5/25/03 Active. Adult incubating.
 5/26/03 Inactive. Adults away from the nest. Scrape empty. Strong rain storm & winds moving through area. No signs of predation.
 *Loss may have been due to adverse weather conditions.

Pair #8/Nest #H9
Hatteras Inlet, “Circle Closure”, N end of interdunal rd.
N 35°19037 W 75°74232

5/24/03 Active. Adult incubating 2 eggs. Closure modified. Nest was laid within 10 feet of original boundary.
 5/28/03 Active. Adult incubating. Unknown number of ORVs broke boundary string and drove through closure coming within 10 feet of nest.
 5/31/03 Active. Adult incubating.
 6/01/03 Active with 3 eggs.
 6/05/03 Active. Adult incubating.
 6/09/03 Active. Adult incubating.
 6/12/03 Active. Adult incubating 3 eggs.
 6/14/03 Active. Adult incubating.
 6/20/03 Active. Adult incubating.
 6/21/03 Active. **Hatched** 3 chicks.
 *Pair observed with 3 chicks at 6:30 PM near the SW corner of the closure (within 10 feet of ORV traffic on 2 sides of closure.
 6/22/03 Birds not in closure. Unable to locate. Could have moved into large closure?
 6/23/03 Chicks not found. There is an adult pair in the main closure behind the skimmers. Could be the same pair as they originally were setting up territory in this location before moving to the north; however, no chicks could be found. Chicks could have been run over trying to cross over to larger closure? Also, lost dog in the loose in the closure. Has been terrorizing other birds.
 *Cause of failure is unknown.

Pair #9/Nest #H10
Cp. Pt. Bird closure, 0.3 mi. E of Salt Pond Rd
N 35°22580 W 75°53467

5/23/03 Active. Adult incubating 2 eggs. Nest laid on small dune at base of large dune amidst the vegetation. Well hidden.
 5/26/03 Active. Adult incubating 1 egg. No sign of loss for other egg.
 5/31/03 Inactive. Last egg gone. No signs of loss.
 *Cause of failure is unknown.

Pair #10/Nest #H11
N of Avon, 3.4 mi. S of R30, Closure #03-017
N 35°38773 W 75°48969

6/06/03	Active. Adult incubating 2 eggs. Boundary erected.
6/08/03	Active. Adult incubating.
6/12/03	Active. Adult incubating 2 eggs.
6/19/03	Active. Adult incubating.
6/20/03	Active. Adult incubating 2 eggs.
6/26/03	Active. Incubating.
6/29/03	Active. Hatched 2 chicks Erected directional arrow signs to detour traffic towards shoreline as well as “chicks in area” signs to slow traffic *Closure expansion request placed to extend boundary 100 feet towards the shoreline. This would still leave ample room for ORVs to pass during all tides.
6/30/03	Active. Both chicks located at the south end of the closure back in the dunes.
7/03/03	Active. Cold, rainy, windy weather. Both chicks were tucked under parent near the dunes.
7/04/03	Active with 2 chicks. Closure modification approved on 7/02/03, signs extended towards ocean 100 feet.
7/05/03	Active. Both chicks observed.
7/06/03	Active. Both chicks observed ~20 ft outside of southern boundary, in ORV area.
7/08/03	Active. Chicks observed ~100 ft outside of southern boundary in ORV area.
7/09/03	Request placed to expand boundary southward by 200 ft.
7/10/03	Active. Both chicks found ~50 ft to the N of the closure in ORV area. Additional request placed to expand boundary 100 ft to the N.
7/11/03	Active. Both chicks found behind the dunes within the original closure.
7/13/03	Active. Both chicks found 0.2 mi. N of original closure with adult near the dune base.
7/14/03	Active. Whole family within the original closure in the morning and found 0.2 mi. N of closure in the afternoon. Divided the 200 ft granted for expansion (as requested on 7/9), to 100 ft to the N as well as the S. In addition, 2 directional arrow signs were placed at 0.2 mi. N of the closure to direct traffic towards the tideline. Three more large “chicks in area” signs were erected on the lower beach to connect to original boundary.
7/17/03	Closure modification requested to expand northern boundary 0.2 mi. and an additional 50-ft towards the tide when the chicks begin feeding at the shoreline.
7/18/03	Chicks are getting big. Remaining within area semi-protected area with arrow & chick signs. Still up by dunes.
7/24/03	Active. Family hanging out more towards N end where arrow signs are located, closure expansion still pending approval. One chick growing faster than the other. Has distinctive black/white feathering, bill is becoming more distinctively orange and is larger. The other chick still very fuzzy and “chick like”.
7/25/03	Family found to the N of the arrows in the morning...in a highly unprotected place. One adult was near duneline with the chicks while the other adult was feeding at the tideline. Heavy, heavy rains. All birds back within the ‘arrowed’ section in the afternoon.
7/26/03	Active. All birds in same area (‘arrowed’ section). Larger chick practicing for flight.
7/27/03	Active. All within arrows – ORV drove through this section.
7/28/03	Active. Chicks both within arrowed section.
7/31/03	Active. Chicks both within arrowed section. Have been observed moving outside of signs & to the N. Larger bird practicing flight again by running & flapping wings. Smaller chick observed stretching wings. Both have been feeding near the dunes – observed pecking sand on high beach.
8/02/03	Active. At north end by arrow signs. Chicks pecking at ground in early am. Later am adults at shoreline and chicks low on beach – unprotected. *Closure modification requested.
8/04/03	Active. All within arrow signs.
8/05/03	Active. Large chick FLEDGED
8/06/03	Active. Both adults with fledgling at ephemeral pool. Smaller chick up at dune line.
8/11/03	Active. Modification request approved.

8/14/03` Active. Whole family 0.4 mi. N of closure at ephemeral pool. Small chick getting bigger – tail feathers coming in.
 8/16/03 Active. Smaller chick **FLEDGED** Closure removed.
 8/21/03 All moving N of original closure. Currently at 2.2 mi. S of R30.

Pair #3/Nest #H12
South Beach, 1.1 mi. SW of Cape Point campground drain
N 35°37552 W 75°49277
 “Mr. & Mrs. Greenlegs”
 Band combination: L – W/G flag; R – G/G
 *third nest attempt

6/06/03 Active. Incubating 2 eggs. Nest laid near boundary.
 6/08/03 Active. Incubating. Very strong winds and rain.
 6/09/03 Active. Incubating 3 eggs. Boundary extended to allow for additional buffer from ORV traffic.
 6/12/03 Active. Incubating.
 6/14/03 Active. Incubating.
 6/19/03 Inactive. Eggs gone. No signs of loss.
 *Cause of failure is unknown.

Pair #5/nest #13
Hatteras Inlet proper
N 35°18955 W 75°75022
 *second nest attempt

6/12/03 Active. One egg in the nest.
 6/18/03 Active. Incubating 3 eggs.
 6/23/03 Inactive. Nest lost. Lots of raccoon tracks in area but none leading directly to empty nest scrape.
 No shell fragments found.
 *Cause of failure is unknown. Possible predation by raccoon.

Pair #4/nest #14
Cp. Pt. Bird Closure, west end behind shipwreck
N 35°22795 W 75°53755
 *second nest attempt

6/22/03 Active. 1 egg.
 6/28/03 Inactive. Egg gone. No shell fragments found. Unidentified mammal tracks found leading up to nest and within 6 inches of empty scrape. Tracks too blown out/faint to identify.
 *Cause of failure due to predation by an unknown mammalian predator.

Pair #3/nest #15
S. Beach, 0.5 mi. SW of Cape Point campground drain
N 35°23390 W 75°55950
 “Mr. & Mrs. Greenlegs”
 Band combination: L – W/G flag; R – G/G
 *fourth nest attempt

7/05/03 Active. Incubating 2 eggs.
 7/08/03 Unknown. Birds not on nest when passed by while off duty – unable to check status.
 7/10/03 Inactive. Both birds away from the nest. Eggs gone. No shell fragments found. Crow tracks were located within 2 ft of nest. Fox tracks also found within 5 ft of nest. Fox tracks were very faint and wind blown. Not able to see any that lead directly to nest scrape.
 *Cause of nest failure likely due to either avian or mammalian predator.

Pair #1/nest #16
Buxton Washout
N 35°27825 W 75°51699

Band combination: L – R/G flag; R – B R/R
*second nest attempt

6/29/03	Empty scrape found in active tern colony.
7/06/03	Active. Incubating 2 eggs. Fresh cat tracks found in area.
7/17/03	Active with 2 eggs incubating. Cat trapped and removed.
7/18/03	Active with 2 eggs incubating.
7/24/03	Active. Both eggs in scrape but adults both feeding at tideline.
8/02/03	Active. 2 eggs present.
8/10/03	Inactive? 2 eggs in nest but no adults present. No adult tracks around nest scrape. Rainy, cold day. Have had stormy weather for past few days. Eggs left to elements. Abandoned?
8/24/03	Inactive. Eggs gone and birds gone.

Pair #5/nest #17
Hatteras Inlet Spit
N 35°18977 W 75°75046

*third nest attempt

7/10/03	Active with 1 egg incubating.
7/11/03	Active with 2 eggs incubating.
7/12/03	Inactive. Both eggs gone. Nest site completely washed over by storm tide...nest scrape flattened. *Cause of nest failure due to overwash by storm tide.

Ocracoke Island

Pair #1, Nest # O1 0.1 miles NE of Ramp 59 N 35.18439 W 075.77383

5/5/03 Initial observation of nest with 2 eggs in ORV area. Nest site protected by erecting a closure.
5/7/03 Adult observed on nest. Other adult chased a crow away. 3 humans. 2 vehicles. 1 predator within .02 miles.
5/14/03 Adult observed on nest. 1 human. 1 vehicle. 0 predators.
5/22/03 Adult observed on nest. 2 humans. 2 vehicles. 1 predator within .05 miles.
5/30/03 Adult observed on nest. 5 humans. 2 vehicles. 0 predators
6/1/03 Nest lost. Cat tracks going up to the scrape. Cat scat within a foot from scrape. Evidence of parents feeding a hatchling.
8/14/03 closure removed

Pair # 2, Nest # O2 5 miles NE of Ramp 67 N 35.16631 W 075.82243

5/10/03 Initial observation of nest with 2 eggs in day use area.
5/13/03 Adult observed on nest. Both parents present. Nest site protected by erecting a closure.
5/15/03 Adult observed on nest. Flushed when drove by closure. Other parent near by. 0 humans. 0 vehicles. 0 predators.
5/16/03 Adult observed on nest.
5/19/03 Nest lost. Heavy rain and wind the night before. Three signs down around nest.

Pair # 3, Nest #O3 6.3 miles NE of Ramp 67

5/10/03 Initial observation of nest with 2 eggs in day use area.
5/13/03 one adult on nest, other feeding. Nest site protected by erecting a closure.
5/15/03 Adult observed on nest. 1 human (0.1 miles). 0 vehicles. 0 predators.
5/16/03 Nest lost. No adults in area. Small mammal tracks seen within 2 feet from scrape. Specie unknown, heavy rains washed over tracks.

Pair # 4, Nest # O4 Ocracoke Inlet Flats N 35.07139 W 076.01123

5/14/03 Initial observation of nest with 2 eggs in closed area. No closure needed.
5/20/03 Adult observed on nest. One adult has a visible limp.
5/23/03 Adult observed on nest. 4 humans (.04 miles). 4 vehicles (0.4 miles). 0 predators.
5/26/03 Adult observed on nest. 2 humans (0.8 and 0.1 miles). 2 vehicles (0.8 and 0.1 miles). 0 predators.
5/30/03 both parents present. Adult observed on nest. Common tern and skimmer colony formed around nesting site.
6/3/03 No adults present. Both eggs still in scrape. Abandoned?
6/13/03 Adult observed on nest. One egg in process of hatching, 28 humans (1 mile), 3 humans (0.9 miles), 10 humans (.7 miles), 1 human (.4 miles), 3 humans (0.2 miles), 6 humans (.1 miles). 10 vehicles (1 mile), 1 vehicle (0.9 miles), 4 vehicles (0.7 miles), 1 vehicle (0.4 miles), 3 vehicles (0.2 miles), 4 vehicles (0.1 miles). 15-20 predators

6/14/03 Chick hatched. Both parents present and acting very defensive. Other egg shows no signs of hatching.
 6/23/03 Chick gone. Stormy the past week. Other egg abandoned? No adults present.
 6/27/03 other egg abandoned

Pair # 5, Nest # O5
1.4 miles north of Ramp 70
N 35.11448 W 075.93907

5/19/03 Initial observation of nest with 2 eggs in ORV area. Nest site protected by erecting a closure. *3 humans (0.5 miles), 2 vehicles (0.5 miles), 0 predators*
 5/22/03 Adult observed on nest. *0 humans, 0 vehicles, 0 predators*
 5/27/03 Nest lost. No adults in area. No tracks or shells.
 9/2/03 closure removed

Pair # 6, Nest # O6
0.8 miles north of Ramp 67, on top of dune
N 35.13853 W 075.88950

5/20/03 Initial observation of nest with 2 eggs in day use area. Nest site protected by erecting a closure.
 5/22/03 Both parents in area, nest hard to see can't tell if one is on nest. *2 humans (0.1 and 0.3 miles). 0 vehicles. 0 predators.*
 5/23/03 both parents present, but may not be sitting on nest.
 5/26/03 Nest lost. Windy the past few days. The nest could have been pushed over the dune.
 8/27/03 closure removed

Pair # 7, Nest # O7
Ocracoke Inlet flats
N 35.06920 W 076.00570

5/20/03 Initial observation of nest with 1 eggs in closed area. No closure needed. Nest located inside of a common tern colony. Common tern egg is in the same scrape as AMOY egg.
 5/23/03 Can't see who is on the nest, could be a tern. *1 human (0.5 miles), 2 humans (0.7 miles). 1 vehicle (0.5 miles), 1 vehicle (0.7 miles), 0 predators.*
 5/30/03 Nest lost. Area overwashed. Both adults feeding at surf.

Pair # 2, Nest # O8
4.1 miles north of ramp 67
N 35.16105 W 075.83656

5/26/03 Initial observation of nest with 2 eggs in day use area. Nest site protected by erecting a closure.
 5/27/03 Adult on nest. *2 humans (0.3 miles).*
 6/3/03 Nest lost. No adults in area. Dog tracks around closure, but not inside. No shells or tracks around nest.
 6/30/03 closure removed

Pair # 9, Nest # O9
2.7 miles south of Ramp 59
N 35.16558 W 075.82432

5/31/03 Initial observation of nest with 3 eggs in day use area. Nest site protected by erecting a closure. *0 humans, 0 vehicles, 0 predators.*
 6/2/03 one adult on nest. Flushed when driven by. Other adult near by.
 6/5/03 Adult on nest. *0 humans, 0 vehicles, 0 predators.*

6/13/03 only 2 eggs in scrape. No shells or tracks. Parents near nest. *0 humans. 0 vehicles. 0 predators.*
 6/17/03 Adult on nest. *0 humans. 0 vehicles. 0 predators.*
 6/24/03 Adult on nest.
 6/28/03 One egg hatched, brood 0.2 miles north of closure. Requested to expanded closure submitted. *0 humans. 0 vehicles. 0 predators.*
 7/7/03 car in non-ORV area parked near chick. Chick hiding in dune. *3 humans (0.2 miles). 1 vehicle (0.2 miles). 0 predators.*
 7/10/03 closure approved and installed. Chick seen with both parents.
 7/17/03 Chick gone. Parents in area, but when approached, they fly away.
 8/27/03 Closure removed.

Pair # 3, Nest # O10
0.9 miles south of Ramp 59
N 35.17393 W 075.00199

6/9/03 Initial observation of nest with 2 eggs in day use area. Nest site protected by erecting a closure.
 6/14/03 Adult seen on nest. *0 humans, 0 vehicles, 0 predators.*
 6/17/03 Adult on nest. *0 humans, 0 vehicles, 0 predators.*
 6/23/03 Adult on nest. *0 humans, 0 vehicles. 0 predators.*
 7/2/03 Only one egg in scrape. No tracks or shells. *0 humans. 0 vehicles. 0 predators.*
 7/6/03 Nest lost. Crow tracks leading up to scrape. No shells present.
 8/14/03 closure removed

Pair # 1, Nest # O11
0.12 miles north of Ramp 59
N 35.18569 W 075.77302

6/15/03 Initial observation of nest with 1 eggs in ORV use area. Nest site protected by erecting a closure. *2 humans (0.3 miles). 1 vehicle (0.3 miles). 2 predators (0.3 miles).*
 6/17/03 Now 2 eggs in scrape. Adult on nest. *0 humans. 2 humans (.03 miles). 0 predator.*
 6/19/03 Now 3 eggs in scrape. Adult on nest.
 6/24/03 2 eggs gone. Only one egg in the scrape. No tracks or shells. One adult near nest. *0 humans. 0 vehicles. 0 predators.*
 6/28/03 Nest lost. Parents present 0.4 miles south of closure. Rabbit and cat tracks near scrape.

Pair # 7, Nest # O12
Ocracoke Inlet Flats
N 35.06920 W 076.00572

6/13/03 Initial observation of nest with 2 eggs in closed area. No closure needed.
 6/27/03 Adult on nest. Pair is very shy and flushes from very far away. *1 human (0.2 miles), 7 humans (0.5 miles). 1 vehicle (0.2 miles), 2 vehicles (0.5 miles). 0 predators.*
 7/10/03 Adult on nest. Flushed from afar. Other parent present and false nesting.
 7/15/03 One Chick hatched. Other egg looks abandoned. Chick is hard to see. Parents are very good at hiding it.
 8/11/03 Both parents seen with chick.
 8/21/03 Chick is now a fledgling.

Table 1. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2003

Location	Pair	Nest	Egg	Nests Lost or Abandoned		Nest Hatch		Egg Hatch		Chicks Fledged		Nests with Fledged Chicks		Productivity (fledglings/breeding pair)
	#	#	#	#	%	#	%	#	%	#	%	#	%	
Bodie Island	3	5	13	4	80%	1	20%	2	15%	0	0%	0	0%	0.00
Green Island	3	3	7	unk.*	unk.*	1**	unk.*	1**	unk.*	unk.*	unk.*	unk.*	unk.*	unknown**
Hatteras Island	16	23	53	13	57%	10	43%	21	40%	6	29%	5	22%	0.38
Ocracoke Island	8	12	23	8	67%	4	33%	4	17%	1	25%	1	8%	0.13
Totals	30	43	96	25*	58%	16**	37%	28	29%	7*	25%	6*	14%	0.23

* Fate of two nests unknown.

** One nest known to have hatched, others unknown.

Table 2. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2002

Location	Pair	Nest	Egg	Nests Lost or Abandoned		Nest Hatch		Egg Hatch		Chicks Fledged		Nests with Fledged Chicks		Productivity (fledglings/breeding pair)
	#	#	#	#	%	#	%	#	%	#	%	#	%	
Bodie Island	2	5	11	4	80%	1	20%	2	18%	2	100%	1	20%	1.00
Hatteras Island	17	25	57	22	88%	3	12%	5	9%	4	80%	3	12%	0.24
Ocracoke Island	12	18	43	12	67%	6	33%	12	28%	3	25%	3	17%	0.25
Totals	31	48	111	38	79%	10	21%	19	17%	9	47%	7	15%	0.29

Table 3. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2001

Location	Pair	Nest	Egg	Nests Lost or Abandoned		Nest Hatch		Egg Hatch		Chicks Fledged		Nests with Fledged Chicks		Productivity (fledglings/breeding pair)
	#	#	#	#	%	#	%	#	%	#	%	#	%	
Bodie Island	2	3	6	2	67%	1	33%	2	33%	1	50%	1	33%	0.50
Hatteras Island	24	28	55	18	64%	10	36%	18	34%	6	33%	6	21%	0.25
Ocracoke Island	13	15	35	4	27%	11	67%	22	52%	17	77%	8	53%	1.07
Totals	39	46	96	24	52%	22	48%	42	44%	24	57%	15	33%	0.62

Table 4. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 2000

Location	Pai r	Nes t	Eg g	Nests Lost or Abandoned		Nes t	Hatc h	Eg g	Hatc h	Chicks Fledge d		Nests with Fledged Chicks		Productivity (fledglings/breeding pair)
	#	#	#	#	%	#	%	#	%	#	%	#	%	
Bodie Island	2	3	3	3	100%	0	0%	0	0%	0	0%	0	0%	0.00
Hatteras Island	23	29	82	19	66%	10	34%	21	26%	2	10%	2	7%	0.09
Ocracoke Island	12	17	40	10	59%	7	41%	11	28%	7	64%	5	29%	0.58
Totals	37	49	125	32	65%	17	35%	32	26%	9	28%	7	14%	0.24

Table 5. American Oystercatcher Breeding Activity at Cape Hatteras National Seashore 1999

Location	Pai r	Nes t	Eg g	Nests Lost or Abandoned		Nes t	Hatc h	Eg g	Hatc h	Chicks Fledge d		Nests with Fledged Chicks		Productivity (fledglings/breeding pair)
	#	#	#	#	%	#	%	#	%	#	%	#	%	
Bodie Island	2	2	3	2	100%	0	0%	0	0%	0	0%	0	0%	0
Hatteras Island	24	31	71	24	77%	7	23%	13	18%	3	23%	3	10%	0.13
Ocracoke Island	15	17	36	10	59%	7	41%	10	28%	2	20%	2	12%	0.13
Totals	41	50	110	36	72%	14	28%	23	21%	5	22%	5	10%	0.12